

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
1	IS&R	L1	1	("6775137").PN.	USPAT	2005/01/10 14:58			
2	BRS	L2	0	(electrical or electronic) same (rack or cabinet) and (cooling and sound-absorbing) and casters	USPAT	2005/01/10 14:59			
3	BRS	L3	496	(electrical or electronic) same (rack or cabinet) and casters	USPAT	2005/01/10 14:59			
4	BRS	L4	0	(electrical or electronic) same (rack or cabinet) and cooling and sound-absorbing and casters	USPAT	2005/01/10 15:00			
5	BRS	L5	0	(electrical or electronic) same (rack or cabinet) and sound-absorbing and casters	USPAT	2005/01/10 15:12			
6	BRS	L6	1	(electrical or electronic) same (rack or cabinet) and cooling and sound-absorbing and casters	USPAT	2005/01/10 15:00			

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
7	BRS	L7	7	(electrical or electronic) same (rack or cabinet) and cooling and sound-absorbing	USPAT	2005/01/10 15:01			
8	BRS	L8	26	(electrical or electronic) same (rack or cabinet) and sound-absorbing	USPAT	2005/01/10 15:02			
9	BRS	L9	9	(electrical or electronic) same (rack or cabinet) and sound-absorbing	US-PGPUB ; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 15:05			
10	BRS	L10	195	(electrical or electronic) same (rack or cabinet) and (sound same absorb\$3)	US-PGPUB ; USPAT ; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 15:06			
11	BRS	L11	496	(electrical or electronic) same (rack or cabinet) and casters	USPAT	2005/01/10 15:15			

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
12	BRS	L12	24	11 and servers	USPAT	2005/01/10 15:17			
13	BRS	L13	162	11 and computers	USPAT	2005/01/10 15:23			

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
1	BRS	L1	1	"6308180"	USPAT	2005/01/10 12:40			
2	IS&R	L2	1	("6305180").PN.	USPAT	2005/01/10 12:41			
3	IS&R	L3	10	((("6175498") or ("6026565") or ("5880931") or ("5835349") or ("5196989") or ("5016138") or ("4514746") or ("4315300") or ("3754596") or ("3317798")).PN.	USPAT	2005/01/10 12:43			
4	BRS	L4	54488	(rack or cabinet) same (cooling (unit ot module))	USPAT ; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 12:44			
5	BRS	L5	2024	"361"/\$.ccls. and 4	USPAT ; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 12:59			

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
6	BRS	L6	101	5 and condens\$1r	USPAT; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 12:51			
7	BRS	L7	156	5 and drawer\$1	USPAT; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 12:58			
8	BRS	L8	1425	4 and servers	USPAT; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 12:59			
9	BRS	L9	268	"361"/\$.ccls. and 8	USPAT; EPO; JPO; DERWE NT; IBM_T DB	2005/01/10 13:02			

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
10	IS&R	L10	30	(("6336691") or ("6198628") or ("6186890") or ("6164369") or ("6127663") or ("6119768") or ("6088225") or ("5982616") or ("5953930") or ("5851143") or ("5826432") or ("5823005") or ("5765743") or ("5671805") or ("5544012") or ("5509468") or ("5467607") or ("5460441") or ("5329425") or ("5285347") or ("5150277") or ("4860163") or ("4851965") or ("4672509") or ("4352274") or ("4315300") or ("4196526") or ("4089040") or ("3749981") or ("3120166")) .PN.	USPAT	2005/01/10 13:07			
11	BRS	L11	19	"3749981"	USPAT	2005/01/10 13:08			

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
12	IS&R	L12	3	((("3396780") or ("3387648") or ("3132288")).PN.	USPAT	2005/01/10 13:09			
13	BRS	L13	28	(servers same blades) same fans	USPAT	2005/01/10 13:36			
14	BRS	L14	253	(computer\$1 same blade\$1) same fans	USPAT	2005/01/10 13:39			
15	BRS	L15	677	rack and ((server\$1 or blade\$1) same fan\$1)	USPAT	2005/01/10 13:40			



US006315655B1

(12) **United States Patent**
McEwan et al.

(10) **Patent No.:** **US 6,315,655 B1**
(45) **Date of Patent:** **Nov. 13, 2001**

(54) **LOW PROFILE COMPUTER CASE AND COMPUTER**

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(73) Assignee: **Technology Advancement Group, Inc.**, Dulles, VA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/516,706**

(22) Filed: **Mar. 1, 2000**

(51) Int. Cl.⁷ **H05K 7/20**

(52) U.S. Cl. **454/184; 361/695**

(58) Field of Search **454/184; 361/694, 361/695**

(56) **References Cited**

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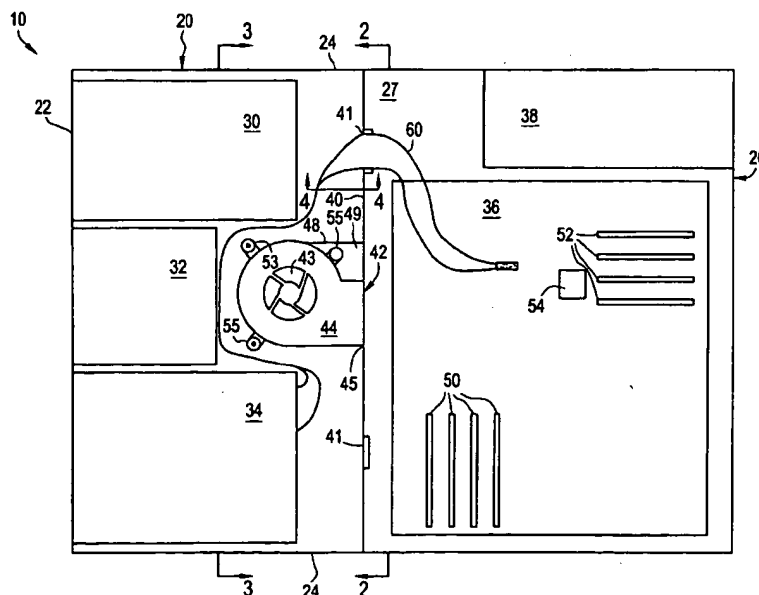
Primary Examiner—Harold Joyce

(74) *Attorney, Agent, or Firm*—Nixon Peabody LLP; Marc S. Kaufman

(57) **ABSTRACT**

A low profile computer case having two centrifugal blowers mounted in a partition therein. An intake port of a first blower faces a bottom panel of the case and an intake port of the second blower faces a top panel of the case. Standoff dimensions are defined between the respective intake ports and panels to permit operation of the blowers.

16 Claims, 6 Drawing Sheets





US005460441A

United States Patent [19]

Hastings et al.

[11] **Patent Number:** 5,460,441[45] **Date of Patent:** Oct. 24, 1995[54] **RACK-MOUNTED COMPUTER APPARATUS**

5,381,315 1/1995 Hamaguchi et al. 361/727

[75] **Inventors:** Robert J. Hastings, Kingwood; Paily T. Varghese, Tomball, both of Tex.*Primary Examiner*—Kenneth J. Dorner
Assistant Examiner—Rodney B. White
Attorney, Agent, or Firm—Konneker & Bush[73] **Assignee:** Compaq Computer Corporation, Houston, Tex.[57] **ABSTRACT**[21] **Appl. No.:** 332,717[22] **Filed:** Nov. 1, 1994[51] **Int. Cl.⁶** A47B 77/08[52] **U.S. Cl.** 312/298; 312/223.2; 312/334.4;
312/334.8; 312/310; 312/309; 312/301;
312/236; 312/138.1; 361/683; 361/684;
361/685; 361/687; 361/695; 361/725; 361/726;
361/727; 361/610[58] **Field of Search** 312/334.4, 223.2,
312/138.1, 236, 311, 329, 334.8, 309, 301,
310, 322, 298, 299; 361/610, 725, 726,
727, 687, 695, 683, 684, 685[56] **References Cited****U.S. PATENT DOCUMENTS**

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A rack mounted computer system has a vertically elongated cabinet structure in which a specially designed server unit is mounted. The server unit includes a slide-out outer drawer having a power supply box mounted in a lower interior portion thereof. An inner tray is slidably mounted in an upper interior portion of the outer drawer, over the power supply box, and has a system planar board and associated riser cards mounted on its top side. When the outer drawer is pulled out service access is provided to the circuit board apparatus on the inner tray. Access is provided to the power supply box by simply sliding the inner tray rearwardly relative to the opened outer drawer to expose the power supply box. Cooling fans are carried on the inner tray and within the outer drawer to cool the various computer components mounted within the server unit by flowing cooling air generally horizontally therethrough. The cabinet structure is provided with a front access door and a rear panel having ventilation openings therein. During operation of the server unit cooling fans, ambient air is sequentially drawn inwardly through the front access door ventilation openings, horizontally flowed through the server unit, and then horizontally discharged through the ventilation openings in the rear panel of the cabinet structure.

27 Claims, 5 Drawing Sheets